

## BUF634

So you want to build a hybrid amplifier, maybe a small headphone amplifier. But how to proceed? Which tube front end? (Well, that's an easy question to answer: Aikido amplifier. Of course, it doesn't have to be an Aikido front end.) Which solid-state output stage? Which technology? Which topology?

The easy way out is to use prepackaged silicon, for example IC power amplifiers and unity-gain buffers, as these in these small and tidy packages all difficult decisions have been made for us; we need only hook up the wires. Of course, their main liability is that all the choices have been made for us and there is little that we can do to alter the device.

Ken, a reader from Australia, wrote asking about the suitability of using the Bur-Brown BUF634 with a 6GM8-based Aikido amplifier that used a 24-volt power supply. The buffer and Aikido amplifier would run of the same low-voltage power supply (+24V).

If the BUF634s were not so hard to get in the TO-220 package, I think that this would make a wonderfully easy way to build a great little headphone amplifier. This IC boasts some excellent specifications (slew-rate of 2000V/ $\mu$ S, for example) and it just might sound good as well.

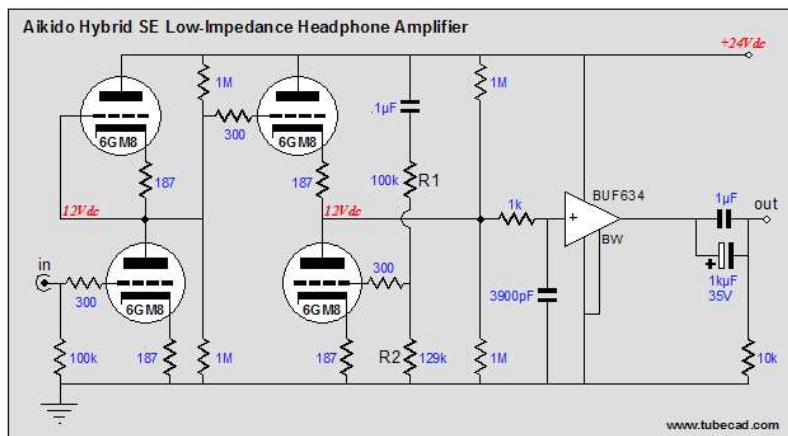


250mA High-Speed Buffer (buf634.pdf)

### BUF634

Number of Channels	1
Iq per Channel(Max)(mA)	20
Vs(Min)(V)	4.5
Vs(Max)(V)	36
Acl, min stable gain(V/V)	1
BW @ Acl(MHz)	180
Pin/Package	5 DDPAK/TO-263, 5 TO-220, 8 PDIP, 8 SOIC
Approx. 1KU Price (US\$)	3.05
Vn at Flatband(Typ)(nV/rtHz)	4
Slew Rate(Typ)(V/us)	2000
Settling Time (0.1%)(Typ)(ns)	200
Io(Typ)(mA)	250
Vio(Max)(mV)	100
Iib(Max)(nA)	20000
Diff Gain(%)	0.4
Diff Phase(deg)	0.1

Be sure to get the TO-220 package and put a good heatsink on it. Also, be sure to ground the BW pin, as it increases the idle current up by tenfold (15mA and I bet it sounds much smoother this way, as it means that the class-A range of operation has been increased by a hundredfold, in terms of power output).



I added the 1k resistor and 3900pF to limit the high-frequency bandwidth to 40kHz; feel free to experiment. This circuit looks truly cool to me; I would love to hear it in person. The IC can withstand 36 volts across it, so it might be fun to experiment with 36V as the B+ voltage, but I am sure it will sound great with just the 24 volts, or even only 12.6V. Careful wiring practice is critical with this device, as it is a super-wide bandwidth design, so a low-inductance layout is crucial as are power supply bypass capacitors at the IC's power supply connections. As a National Semiconductor datasheet puts it.